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ABSTRACT

This study investigated whether or not there is a difference in the academic achievement level maintained by a student after a transition has been made from a self-contained classroom to an open classroom. The sample included all the population in a fifth grade open classroom. The experimental group were from a fourth grade self-contained classroom, while the control group were from a fourth grade open classroom. The groups were compared on the basis of two standardized pre- and post-measures. The study concluded that the transition from a self-contained classroom to an open classroom tends to produce no significant difference in academic achievement; the independent variable (the open classroom) tended to produce a considerable mean gain in academic achievement for both groups. (Author/MLF)

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A COMPARISON OF FIFTH GRADE ACHIEVEMENT IN AN OPEN-CLASSROOM BETWEEN STUDENTS WHO WERE IN A FOURTH GRADE SELF-CONTAINED AND STUDENTS WHO WERE IN A FOURTH GRADE OPEN-CLASS

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CHAPTER I

INTRODUCTION

The vast array of professional literature available today suggests many alternatives to "traditional" education. These alternatives, defined by many and varied terms, point directly or indirectly to the concept of "open education" or "informal education." The elementary schools in particular have been the focal point of the issue: traditional vs. open education.

In a mobile society such as exists in the U.S., students may be required to make the transition to a new educational setting quite often. Within a school district it may be necessary to change boundaries to control individual school populations causing some students to make a similar transition. When this occurs, parents, teachers and administrators alike realize the move, for whatever reason, may be upsetting to a child particularly if the new school's architecture and organization is different to that child.

As well as being concerned regarding the emotional and psychological and social adjustment of students making a transition, for example, from a self-contained to an open-

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classroom, there is concern and obligation to the powers that be to assess students' academic achievement within any architectural design or organizational structure.

Statement of the problem. This study has been initiated to investigate whether or not there is a difference in the academic achievement level maintained by a student after a transition has been made from a self-contained classroom to an open classroom.

Purpose of the study. It will be necessary to compare students' academic achievement after moving from a self-contained to an open classroom with the academic achievement of students who have been in an open classroom for two years. Specifically, the researcher will compare and then determine if a significant difference in the achievement in an open classroom fifth grade exists between students with a fourth-grade self-contained background and students who spent their fourth grade in an open classroom.

Statement of hypothesis. There is no significant difference in academic achievement between fifth grade students in an open classroom whose fourth grade year was

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spent in a self-contained classroom and those whose fourth grade was spent in an open-classroom.

Assumptions underlying hypothesis. The researcher assumes the socio-economic level for all the subjects is similar as they were chosen from the enrollment of the same school and the surrounding neighborhood reflects basically the same socio-economic level.

It is also assumed that each subject in the self-contained group came from a similar fourth-grade background. This assumption is based on the definition of "self-contained" given by the researcher when identifying the groups for this study.

Likewise, it is assumed that each subject in the open-classroom group came from a similar fourth-grade background also based on the definition of "open-classroom" given by the researcher when identifying the two groups.

Definition of terms. Definitions vary from authority to authority. Important terms used in this study are defined as:

Self-contained classroom: A single classroom which would accommodate one teacher and approximately 30-35 students. The teacher taught all subjects except music, art, and P. E.

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Open-classroom. An architecturally open structure designed to accommodate four teachers in a teaming situation and approximately 100-125 students.

Team-teaching. The organizational structure of teachers involved in an open-classroom in which each teacher acts as a resource person in a specific skill or content area.

Academic achievement. General academic progress from pre-test to post-test indicated by the grade equivalents reported on the SRA Assessment Series.

Grade equivalent. A score representing the year and month in school of students nationally whose median raw score was the same as the given raw score. A GE of 5-3 indicates that the raw score it represents is equivalent to the median raw score of students nationally in the third month of grade five.

Composite. A score compiled from the Reading, Language Arts and Mathematics subtest scores and used as a general index of educational development representing achievement in major skills.

Need for the study. During the 1960's and 1970's the educational trend has moved toward the open-classroom approach yet a somewhat limited amount of objective research exists comparing open education with self-contained education.

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Barth states, "Despite the profusion of information accumulating around open education, there is still virtually no research concerning its effects upon the development of children's thinking, attitudes and behavior as compared with effects associated with more traditional forms of education." (1:13) Other authorities, researchers and critics urge that more evidence of a logical, psychological and empirical nature be gathered and evaluated before the open classroom, team-teaching and other innovations be accepted unquestioned. (8:16)(9:30)(4:9)(7:22)

This researcher wishes to discover whether or not there is, in fact, an achievement difference when students transfer from a self-contained setting to an open classroom. The conclusions derived from this study will be useful locally in informing parents of students transferring into Desert Cove School (an open classroom school) from a self-contained classroom.

Limitations of study. As the population for this study is quite small and the entire population was used as the sample, the researcher realizes the results are less generalizable to other similar situations. (2:116)

The researcher was unable to randomly assign or match the subjects, thus the experimental and control groups may differ in some characteristic. Also, the analysis of

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covariance was not used to reduce initial differences between groups. The inability to control internal and external validity factors may confound the interpretation of the project. (2:392-394)

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CHAPTER II

REVIEW OF LITERATURE

Open education is not a new concept. Its tenets were paramount in the progressive education movement in the United States the earlier part of this century.(13 :87) There was a great deal of rhetoric regarding progressive education, but very little reality in basic changes in methods of teaching or understanding how children learn. Presently, educators in our country are becoming more and more interested in open-education as an alternative to traditional education.

Although much research is still needed,(see Chapter I, p. 5) particularly longitudinal and experimental, several studies have been completed. This studies investigate various problems including students from Primary through Secondary School. Most of the studies research the self-contained and open-classroom simultaneously. No research was found which assessed the achievement of students transferring from self-contained to an open-classroom in comparison with students who had been in an open-classroom a year or more.

Previous research. Lambert (11) investigated classroom interaction, pupil achievement and adjustment in team-

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teaching as compared with the self-contained classroom in grades one through six. The California Achievement Test (1957 ed.) was used to determine achievement with post-test scores as basis for comparison in the first year. Data was compiled over two years. When analyzing achievement, socioeconomic status, grade level and school organization were treated as independent variables. Achievement measures proved to be highly sensitive to differences between school organizations. The open-space teaming group began to move ahead of the self-contained classes in achievement the first year and over-achieved the self-contained classes in almost all scores the second year. Lambert mentions, also, that achievement scores on grade three and six within open-space leveled off in comparison to the other grades and control groups. Lambert concluded that there are significant differences in student achievement between the team and self-contained organization in favor of the open-space concept.

Warner (18) conducted a study comparing student and teacher performance in open-area schools and in self-contained classroom including students in grades two, three and four. Controlled variables were sex, age and randomly assigned groups; the classroom structure was the variable factor. Warner concluded that there was no significant difference in achievement of students in the differently designed schools.

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Based on an investigation of three types of school organization: open classroom, self-contained, departmentalized, Sackett (14) compared self-concept and achievement of sixth grade students. The Self-Esteem Inventory and the Iowa Test of Basic Skills were used as measurement instruments. The concluding data indicated the mean achievement was slightly lower in the open-space school and their mean self-concept score was significantly below that of the subjects in the two traditional schools.

In a similar study, Townsend (17) compared achievement of second and sixth graders with the type of school structure--open classroom, departmentalized or self-contained. He concluded that students in the departmentalized and self-contained structures had higher achievement in more subject areas than the students from the open schools.

McRae (10) and Moodie (12) compared reading achievement of secondary students from an open classroom with students from a self-contained classroom. McRae's study indicated the students from the open-area read less well, showing significantly lower scores on speed and accuracy, vocabulary and comprehension. Moodie's research indicated the open-area students read less well on the first test, but no significant difference was noted on the second test.

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Second, third and fourth graders were studied by Scheirer (15). This study, comparing the open classroom and self-contained classes, used the Stanford Achievement Tests, the Children's Self Concept Indicator and the Children's Attitudinal Range Indicator. Effects of intelligence and parental socioeconomic status were controlled by covariance methods. Data was collected five months after the open classroom was initiated. Over this period of time, no significant differences in achievement were found between the open and traditional schools. The author indicated these results were viewed as tentative and a longer study was needed.

In 1972 the Broward County School (7) conducted a study in an effort to compare types of school organization with achievement. Third, fifth and eighth grade students' achievement was measured by the Comprehensive Tests of Basic Skills and the California Test of Mental Maturity. Data indicated that the open school showed marked gains over the control schools at the third grade level, especially among black students. Fifth grade students who had attended the open school three or more years scored higher on the Math Computation subtest than did students in traditional schools. Eighth grade test results generally favored the traditional school for both sexes and all race groups except black males. It was concluded that the results are not definite enough regarding any particular type of school plant.

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In a study conducted by Cooper and Sterns(5), fourth grade and sixth grade students were assigned to experimental and control groups matched on a basis of mental maturity, socioeconomic status and achievement. Five instruments were utilized in measuring student social adjustment and achievement in reading and language in a team-teaching situation as compared with a self-contained classroom. These instruments included the California Test of Personality, the Bonney-Fessenden Sociograph, the California Test of Mental Maturity and the California Achievement Test as pre- and post-measures. The data was analyzed by means of the PSCE Analysis of Covariance Program at the University of Michigan Computer Center. The fourth grade results indicated the control group mean gain was greater than those of the experimental group in reading achievement. The sixth grade results indicated the control group mean gains were greater than the experimental group in language achievement. Significant differences in sociograph projections favoring the self-contained control groups were indicated. However, the total achievement results indicated no significant difference.

Burnham (3) compared achievement of first grade students in the open school and self-contained. The Canadian Cognitive Abilities Test and the Metropolitan Achievement Test were administered to subjects in two open-plan schools

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and nine conventional schools. Conclusions were that no significant difference in mean scores existed between the two groups.

Another study completed by Burnham (4) using second grade students, the same measuring instruments as mentioned in his previous study and comparing achievement of the two types of school plants indicated marginal differences which were statistically not significant. Again, no significant differences in academic achievement between students in an open classroom and those in a self-contained were indicated.

Pertinent opinion. Bernard Spodek,(6) an advocate of open education, briefly summarized the British Infant School noting ideas such as family groups, integrated day and interest centers, but maintained it would be foolish to superimpose the British system on American schools. Spodek further identified the assumptions underlying open education, decision making and requisites for teaching in an open classroom. Of particular interest to the researcher is the opinion set forth that "Traditional evaluation procedures cannot really test the effectiveness of open education, for we have no good objective measures of quality of expression, divergent thinking or problem solving."(6)

Dr. Sol Gordon (13) suggested that observation remains a fundamental method of assessing certain aspects of

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education. He further suggests that since standardized testing experts emphasize that test results have "limited meanings and should be used only to supplement qualified professional judgments," (13) observation is more important when evaluating open education.

In a paper presented at the National Association for the Education of Young Children in 1971, Drs. Chittenden and Bussis (13) stated:

> . . . we are convinced that research and evaluation efforts are misdirected when they somehow fall into the trap of attempting to measure "achievement" or "cognition" over here, and "self-concept" or "creativity" over there, as if they were to be compartmentalized. . . We should investigate thoroughly the areas of traditional concern: language arts, mathematics, sciences, and should assess whether children's accomplishments in these areas are marked by mindless application of poorly assimilated rules or by judgment and creative effort.

Summary. Throughout the studies cited no specific trend regarding achievement in the open classroom vs. the traditional classroom can be identified. The greater number of studies indicated no significant difference existed.(3)(5)(12)(14)(18) Others concluded significant differences do, in fact, exist but disagreed as to which organization was favored.(10)(11)(17) Two studies indicated no conclusions could be made as more studies were needed.(7)(15)

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Representative of literature regarding the open classroom vs. traditional and implication for research, authorities and critics did not question the need for evaluation, but questioned the practice of using a test written to evaluate achievement in traditional classrooms being used to evaluate achievement in the open classrooms. They maintain that since different means of reaching educational goals are inherent in the two organizations, different measurement instruments should be used.(6)(13)

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CHAPTER III

METHODS AND PROCEDURES

The purpose of this experimental study as stated in Chapter I was to compare and determine if the academic achievement between fifth grade students in an open classroom who spent fourth grade in a self-contained classroom differed from students who had spent their fourth grade in an open classroom. This study hypothesizes that there is no significant difference between the two groups of students at the .05 level of significance.

Selection of the sample. The population consists of 58 fifth grade students in an open classroom at Desert Cove School in the Paradise Valley School District. As this population is small, all 58 subjects are included in the sample; i.e., the population and sample are synonymous.

The experimental group was made up of twenty-five (N=25) fifth graders who were making the transition from a self-contained fourth grade to a fifth grade open classroom. This group consisted of ten girls and 15 boys whose I. Q. range was 92 to 135, with a mean I.Q. of 105. There age range was 9-03 to 11-00, a difference of one year and nine months. (See TABLE I)

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The control group consisted of thirty-three (N=33) fifth graders whose fourth grade was spent in an open classroom. This group consisted of fifteen girls and eighteen boys whose I. Q. range was 82 to 127 with a mean I.Q. of 106. Their age range was 9-08 to 11-01 or a difference of one year and five months.(See TABLE I)

TABLE I

DISTRIBUTION OF STUDENTS PARTICIPATING IN THE FIFTH GRADE ACHIEVEMENT TESTS BY SEX, MEAN I.Q., AGE RANGE AND ORGANIZATION

Organization	Boys	Girls	Mean I.Q.	Age Range
Self-contained Fourth (N=25)	15	10	105	1-09
Open-Classroom Fourth (N=33)	18	15	106	1-05

Description of testing instruments. The instrument used to assess achievement was a standardized test, the SRA Assessment Survey Achievement Series(1972, Revised Ed.)

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As a standardized test, the SRA Achievement Series (ACH) established content validity by (1) considering instructional and curricular materials and (2) carefully weighing reviews by teachers and curriculum specialists. Questions appearing in this test were selected "on the basis that it should be taught, that it is taught, and that it is learned." (16:5)

National standardization or "norming" was accomplished in three stages: (1) school districts from nine census regions were randomly selected, (2) schools, public and non-public, and those containing high school grades were identified and listed. One school was randomly selected from these listed schools and one school was selected from the remaining schools not on the list, (3) one classroom per grade was randomly selected from the selected schools. A sample of 156,000 students were tested of which 118,000 students crossed grades 1 through 9. (16:6)

The ACH reliability of the Blue Test is considered high at a .98 correlation coefficient on the composite score (Reading, Language Arts, Mathematics). (16:6) Since this study dealt with assessing achievement, the SRA Assessment Survey Achievement Test (Blue Test) was considered suitable for use with all subjects.

The Short Test of Educational Ability (STEA) was administered to determine the students' present academic

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aptitude. The test is designed to provide a reliable estimate of general educational ability from a short, easily administered test. The STEA was standardized at the same time the ACH was with the same national sample. "Research has shown that the verbal, number and reasoning abilities measured by STEA are closely related to academic achievement." (16:72)

Form E (Blue Test) of the SRA Assessment Survey Achievement Series and the STEA were administered to both groups as a pretest. Form F of the same series and the STEA was administered as post-tests. There was an eight-month lapse of time between pretest and post-test.

Data collection methods. Data was collected and compiled from a computer printout provided by SRA which reported individual student's achievement results and I.Q. The Composite, which is compiled from the total Reading score and total Language Arts score and total Mathematics score, was reported in terms of grade equivalents, (GE). The comparison between the two groups was based on these grade equivalents.

Research design and procedures. Based on the knowledge that a pretest and post-test had been given to two non-equivalent groups, the research design

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appropriate is the non-equivalent control group design: (2:364)

$$\begin{array}{ccc} O_1 & X & O_2 \\ O_1 & & O_2 \end{array}$$

The self-contained fourth was designated as the experimental group; the open classroom fourth as the control. In this causal-comparative study, the independent variable was the open classroom; the dependent variable was achievement.

The two groups were compared by calculating the mean grade equivalents. A "t"-test was used to determine the significance of the difference between the means.

As hypothesized earlier in this chapter: there is no significant difference in academic achievement between fifth grade students in an open classroom whose fourth grade was spent in a self-contained classroom and those whose fourth grade was spent in an open classroom at the .05 level of significance.

The researcher controlled the test situation by being certain all subjects were given the pretest and post-test at the same time by the same administrator under the same physical conditions. All subjects were in grade five.

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CHAPTER IV

ANALYSIS AND RESULTS

As indicated in the first three chapters, this study sought to compare and determine if a difference in achievement exists between fifth grade open classroom students with a fourth grade self-contained background and fifth grade open classroom students with a fourth grade open classroom background.

Analysis techniques. A "t"-test which provided five bases for comparison was completed for the two groups. The comparisons included information on (1) pretest vs. pretest, (2) post-test vs. post-test, (3) gains vs. gains, (4) pretest vs. post-test for each individual group, (5) mean gain between the two groups.

Description of findings. For purposes of clarity, the Experimental Self-contained Fourth group will be referred to as the SCF group. Likewise, the Control Openclass Fourth group will be referred to as the OCF group.

Of major importance in testing the hypothesis is determining the significance of difference between the mean gains for the two groups. To more clearly understand what

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this means, refer to Table II, Page 22.

The three most important figures to note in this table are the mean for each group and the value of "t". The SCF group had a mean score of 5.04 on the pretest whereas the OCF group had a mean score of 5.02 resulting in a t-ratio of .095 which is not significant at the .05 level of significance. When comparing the results on the post-test, the SCF group had a mean score of 6.32 and the OCF group a mean score of 6.08 resulting in a t-ratio of .675 which is not significant at the .05 level of significance.

Of prime importance in arriving at a conclusion regarding the hypothesis are the findings in the mean gain of each group. As Table II illustrates, the mean gain of the SCF group was 1.28, the mean gain of the OCF group was 1.06. With 56 degrees of freedom and the boundary at 2.000, a t-ratio was found to be not significant at the .05 level of significance.

Other findings. When considering pretest vs. post-test for individual groups, the SCF group had a t-ratio of 8.547. With 24 degrees of freedom and a boundary of 2.797, a .01 level of significance is apparent. With 32 degrees of freedom, a boundary of 2.750 and a t-ratio of 9.260 a .01 level of significance is apparent for the OCF group.

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TABLE II

A COMPARISON OF ACHIEVEMENT (MEAN GAINS)
BETWEEN THE EXPERIMENTAL (SCF) GROUP
AND THE CONTROL (OCF) GROUP

Group	Pretest	Post-test	t-ratio	Mean Gains
Experimental Self-contain Fourth(SCF) N=25	X=5.04 SD=1.30	X=6.32 SD=1.53	8.547**	1.28
Control Open-Class Fourth(OCF) N=33	X =5.02 SD= 1.00	X=6.08 SD=1.11	9.260**	1.06
t-ratio	.095	.675		1.109

*t-value required at .05 level of significance with 56df, 2.000
*t-value required at .05 level of significance with 24 df, 2.064
*t-value required at .05 level of significance with 32 df, 2.042
**t-value required at .01 level of significance with 24df, 2.797
**t-value required at .01 level of significance with 32 df, 2.750

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CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary. Open education as an alternative to traditional education has gained momentum and raised some questions. One question is whether or not a difference exists in academic achievement when a student makes a transition from a self-contained classroom to an open classroom. To arrive at an objective answer, it is necessary to compare and determine if, in fact, there is a difference and to ascertain to what extent that difference is. The hypothesis of this study states there is no significant difference in academic achievement at the .05 level of significance when such a transition takes place.

The sample included all the population (N=58) in a fifth grade open classroom. The experimental group (N=25) were from a fourth grade self-contained classroom with a mean I.Q. of 105 and an age range of 1-09. The control group(N=33) were from a fourth grade open classroom with a mean I.Q. of 106 and an age range of 1-05. The SRA Assessment Achievement Series (Form E: pretest: Form F: post-test) and the Short Test of Educational Ability (STEA) were administered as pre- and post-measures. The Composite

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Grade Equivalents on the pretest and the post-test were used as the basis for comparison. The statistical technique used was "t"-tests.

No significant difference at the .05 level of significance was found on the pretest vs. pretest, post-test vs. post-test and the mean gains between the two groups. On the pretest vs. post-test for the individual groups, a .01 level of significance was indicated for both the control and experimental group.

Conclusions. The following conclusions were based on the findings:

1. The transition from a self-contained classroom to an open classroom tends to produce no significant difference in academic achievement. Therefore, the null hypothesis as stated is accepted.

2. The independent variable (the open classroom) tended to produce a considerable mean gain in academic achievement for both groups.

Recommendations. On the basis of the findings of this study, the following recommendations and implications appear to be warranted:

1. On the basis of the limited sampling procedure of this study as indicated under "Limitations" in ChapterI, it is recommended that this study be carefully analyzed

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before generalizations to other similar populations are made.

2. On the basis of "Pertinent Opinions" in Chapter II, the researcher recommends studies be developed to ascertain if standardized tests used to evaluate traditional schools do, in reality, measure what is taught and what is learned in an open school. If the converse is found to be true, it is further recommended that studies be initiated to develop evaluative measures appropriate for the open classroom.

3. It is recommended that further studies be undertaken to analyze the maintenance levels of students transferring from a self-contained classroom to an open classroom. Also, the recommendation is made that studies of the reverse nature be initiated, i.e., students transferring from an open classroom to a self-contained classroom.

4. This researcher feels it is of prime importance and strongly recommends that more longitudinal and experimental studies be completed regarding traditional education and innovative trends in education in all areas: social, psychological, emotional, academic.

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